

28 DEC 1984

NOTE FOR: DCI

FROM : DDCI

SUBJECT: Topics for Off-Site Conference

Bill:

Here are three things Jim and the Deputies would like to talk about at our planned off-site session.

First, your recent memo on excellence, emphasizing substantive accomplishments rather than the procedural and bureaucratic aspects which you correctly, I think, sense that we have mostly focused on to date. The Deputies are anxious to show you that a lot of what you are seeking is in fact going on, and I think the session by its very nature might generate some more good ideas.

Second, we'd like to talk about the Agency's recruitment problem. You mentioned the other day your thought that perhaps we should be considering decentralizing the recruitment process. Each of the Deputies would like you to understand how much decentralization there already is. Possibly more important, however, having just put the Office of Personnel through the wringer on recruitment issues several different times, we would just as soon avoid the topic of reorganizing the office again. I think we would prefer to talk about what we need to do to get America's academic and maybe business institutions better motivated to help us spot our future employees.

Finally, you asked Jim early on for his thoughts on the world of computers. He is ready to talk about what he thinks ought to be done. That's contained in the attached paper he has already shared with the Deputies, which you should read. The paper should provoke wide-ranging discussions.

I know you'll have other ideas, but these are things on my mind at the moment.



John McMahon

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Information Technology Management

The Agency has long used information technology to accomplish its mission. We are heavy users of information technology:

- in support of analysis;
- in our world-wide communications system;
- to help file and retrieve documents and data;
- for computation, modelling, and simulation;
- in our publications, for sophisticated graphics and the printing process itself;
- in support of our many administrative processes, such as payroll, budget, and contracts management;
- for wordprocessing;
- to create, process, exploit, and store digital imagery.

But senior Agency managers with few exceptions traditionally have treated information technology management issues--the use of computers, office automation equipment, communications--with indifference. (After all, intelligence is our business, not computers!) Of course our experience is quite similar to that of other big computer users, who also long ignored these issues. It is also true that when senior managers have involved ourselves in information technology issues, we have often focused on the wrong part of the problem. Past discussions about "limiting growth in the Agency's use of computer terminals" or about "whether we needed to purchase another mainframe computer" generally fall in this category. But as a result of our lack of attention:

- Technical people and staffers have made the policy and business decisions as well as the technical decisions here for years.
- We have systems designed by computer professionals for computer professionals--they are powerful and fast but difficult to use,

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inflexible, and not "user friendly." (In part, of course, this reflects the age of some of our equipment.)

- We haven't yet found consistent ways to support properly the evolving needs of our users, or even identify systematically their requirements.
- Lower level managers without an adequate understanding of the big picture are sometimes establishing our requirements for information technology and building the systems to meet the need. (Note that this decentralized approach also has been responsible for many of our successes.)

Over the years there have been several attempts to raise the "consciousness" of senior managers about information technology issues. Those trying to do this have generally cited these arguments:

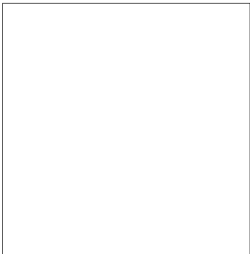
- We must be concerned about the growth of our information technology budget, and about getting the most bang for the buck. (Information technology now consumes about 25 percent of our total budget, and the percentage is growing.)
- Only a limited number of employees really understand the communications, computer and other information technologies; we need to be sure they are working on our highest priority activities.
- If we don't exercise leadership and control centrally, we will be confronted with the development of numerous incompatible systems.

These points are valid, but they haven't stimulated much real commitment to the importance of information technology policy and management issues. No one has yet convinced us that there are real advantages to adding this additional responsibility to our busy schedules. In part this reflects our inability to show our senior

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people how such attention might be in their interest. In part it reflects our inability to focus attention on the possibilities and the opportunities, rather than the costs and the problems. In asserting once again the need for sustained senior attention to these issues, I emphasize these points:

- Increasing numbers of our younger people have grown up with the world of information technology and are comfortable with it. Working to understand and be involved in their concerns will pay dividends all through our organization. Ignoring them increasingly makes us seem unenlightened and, frankly, out of touch with the real world.
- Leadership on information technology issues potentially offers at least as much leverage over what our organization will be like in the future as participation in the budget process has in the past.
- We are exercising no leadership in an area which is absolutely fundamental to our professional capability. We aren't setting the goals we believe we should be pursuing. Instead, we are relying on lower levels in our organization to tell us both where to go and how to get there. Here are some of the issues on which we should have views:

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- In what priority order should we take on responsibility for developing and maintaining large, on-line databases, like DESIST?
 - Should we move toward electronic dissemination (no hard copy) of our finished products and, at what pace?
 - Which sets of employees need to be connected via terminals to which other sets of employees?

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- What is the real potential for artificial intelligence to contribute to our analytic, operational, and management work and what should our priority be in committing resources to these techniques?
- Can today's sophisticated computer-driven imagery presentation techniques improve analysis and operations?
- How can we use information technology to streamline more of our burdensome administrative and managerial processes (budget preparation and re-preparation; travel accountings, etc.)

In nearly all parts of American business, competitive pressures are forcing senior management attention to information technology issues. The attention grows from a sense that its absence may prove fatal, as competitors increasingly harness these information technology tools to gain advantage. We in government aren't directly subject to such competitive pressures. But our general desire for excellence, and our need to maintain first-class facilities and capabilities in order to attract America's brightest young people to our profession, should themselves stimulate action.

To begin to develop workable processes which will help us solve problems, there are five things we need to do:

- Encourage information sharing and cooperation; ✓
- Educate and involve senior managers directly; ✓
- Establish an Agency information technology policy; ✓
- Stimulate imaginative Directorate planning and, most important ✓

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- Focus senior management attention on selected strategic information technology issues.

I. Encouraging Information Sharing and Cooperation

Our Information Systems Board was established a year ago.* It has been an effective forum for the exchange of information and has put people who needed to communicate in touch with each other. More can be done.

I plan to continue the monthly meetings of the Information Systems Board for the purposes of:

- Keeping the key players in touch.
- Encouraging broader understanding of our problems.
- Encouraging experimental activities--such as Artificial Intelligence applications--and tracking and sharing the results of these.
- Educating the key players. (ORD will give a series of presentations on critical technologies in the future. Cray Research, of supercomputer fame, briefed the Board in November on the future of supercomputers and what they can do. We plan other like activities.)
- Providing an open door to those with new ideas for technology, applications and information technology management.

*ExDir chairs; the other 11 members are OC, OS, OIS for DA; ASG, OCR for DI; IMS for DO; OD&E, ORD, OSO, NPIC for DDS&T, and Comptroller.

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- Sponsoring broad-based working groups on selected information technology issues (we have used this technique so far to prepare a computer security investment strategy, and to propose options for our Executive Information System).

II. Educating and Involving Senior Managers

The perspective of senior Agency management is too narrow. We need to educate our managers on a continuing basis. I propose:

- Education designed for executives - We plan to bring IBM to present their one or two-day executive level seminar.
- Hands-on experience for managers - I have tasked ODP to create an executive network linking key senior people together through our electronic mail system. This is already involving top-level managers directly in using our information systems--and it will make them understand better what "user friendly" means!
- Continuing influx of ideas - We need to bring in outsiders on a regular basis--managers from industries that are making imaginative use of information technology to accomplish their work, for example--to discuss their approaches and experiences. (We hope that a senior Reynolds Metals executive will meet with us early in 1985.)
- Increased discussion of options - Senior managers need to be comfortable considering the relation between information systems and physical space, the management of ADP activities, who is best suited to design and develop new information systems, and a host of other information technology issues. Most of all, they need to begin to develop a vision of where we ought to be so that they can

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encourage the use of information technology tools to shape our environment and future capability.

III. Establishing an Agency Information Technology Policy

We need a common understanding of where we want to go, a statement of Agency policy and objectives. Such a statement should recognize the fundamental importance of information technology to our profession, and express our intention to use such technology to:

- Promote the sharing of our information with those we intend to have access to it.
- Separate the wheat from the chaff, helping us sort through the information we collect, to deliver the most meaningful information rapidly to those who need it to do their work (the data reduction problem).
- Improve communication and information security.
- Facilitate the dialogue between our customers, analysts, processors and collectors on requirements issues.
- Help us better analyze the information we have collected. In particular, we need to monitor AI developments closely for potential breakthroughs which will enhance our analytical capabilities in support of production, operations, and management.
- Store information of all kinds--text, maps, images, video-- in original form to free us from the costs (space) and constraints (limited access) of paper storage.
- Give to selected Agency populations the ability to create and maintain their own specialized databases.

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- Communicate our finished intelligence to policymakers more effectively and securely.
- Enter and store information only once.
- Minimize any adverse impact of new information systems on our physical facilities.

In order to accomplish these objectives, we need to develop a set of rules which:

- Encourage the use of available and useful ADP products wherever possible to reduce costs, ensure user acceptance, and allow flexible future growth.
- Assign executive agent responsibility for the development, operation and maintenance of systems of common concern on behalf of all.
- Encourage competent employees to develop the tools and applications they need to do their job themselves ("end-user programming") and give them the tools (personal computers, training, etc.) they need to do so.
- Move us toward a distributed architecture which permits text, graphics, imagery and data to be entered, viewed, manipulated and analyzed either locally or centrally by special purpose equipment as appropriate to the task at hand and the constraints of security.
- Provide one family of terminals with future growth potential and a range of capabilities sufficient to meet most Agency user needs. These terminals should permit easy mastery and transfer between terminal types and they must allow local word processing and use of commercially

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easy access to our mainframes. One family is desirable to: limit the number of vendors with access to our building and equipment, limit the numbers of difficult systems our employees need to master, and increase our (limited at best) leverage over suppliers.

- Enable us to evaluate the competence of those who will be responsible for new development efforts with sizeable multiyear costs. (To help us avoid the past mistakes of SAFE or the FBIS "Rapid" endeavors.)
- Consider the impact of proposed development activities on our physical working environment. (To avoid displacing more people, we need to control the amount of physical space--now approaching one-quarter of our building--consumed by information systems and related activities. DDA has a task force on this issue now.)
- Identify advanced technologies which may be of use and justify their inclusion or exclusion from new systems.
- Enhance our ability to find and hold information technology people who can help us do our work.
- Establish a comprehensive and thoughtful information system planning process at the Directorate level, as well as user support organizations focussed on the unique needs/requirements of our four line Directorates and the seventh floor.

IV. Directorate Planning

A thoughtful planning process should be encouraged at the Directorate level. I emphasize Directorate level because the problems and opportunities faced by the Intelligence, Operations, and

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Administrative Directorates are best considered in a Directorate-wide context. The S&T Directorate case is somewhat less clear, due to the diversity of their functions and the information technology sophistication resident at the Office level.

Planning can be the vehicle which our Deputy Directors use to think through what capabilities they believe their offices or divisions should have. We can encourage this process by requiring periodic plans focused on selected key issues. Following are representative kinds of questions which ought to be addressed in the Directorate planning processes.

For the DI:

- (1) What major databases can we envision the DDI may be asked to build and maintain for ourselves and for the rest of the intelligence community? How large a responsibility will the development and maintenance of such databases be for the Directorate over the next decade?
- (2) How much importance do we attach to developing techniques for the electrical dissemination of our intelligence product to outside customers? After the Cabinet level customers, in what priority order should we extend such service? How much interaction with customers do we anticipate such efforts will promote? How much is desirable?
- (3) Do we see the widespread application of computer-assisted analysis, modeling and design techniques to the intelligence production process? What kinds of problems seem amenable to these techniques?
- (4) Same question for artificial intelligence "expert" systems.

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- (5) Are there substantive problems on which we might improve our performance if analysts could be "on line" with collectors on requirements issues? If so, can we anticipate what our priorities would be in this respect?
- (6) Can we identify areas in which there would be significant savings if we could greatly reduce the amount of human effort expended in entering collected information into databases (automated database generation)?
- (7) Can we identify significant areas of analysis where faster and more powerful computation would result in substantial improvements in the timeliness or quality of the analysis? Are there significant analytical problems which are not being addressed because we lack the computational power or technical expertise to do so?
- (8) Do we envision the need for analysts to have direct access to outside databases, including those maintained by foreign governments possibly in foreign languages?
- (9) What do we need to do about ensuring the accuracy and consistency of data in very large databases so that analysts are all working with the same set of facts?
- (10) How much of this development, operation and maintenance would the DI really wish to control directly, and how much would it seek from central services (ODP, OC, etc.)?

For the DO:

- (1) What major databases do we envision the DDO may be asked to build and maintain for ourselves and for the rest of the intelligence community in the next few years?

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the intelligence community in the next few years?

- (2) To what extent do we think that the rapidly evolving computer-assisted analysis, modelling and design tools being employed in industry may have implications for operations? For operations training?
- (3) Same question for artificial intelligence "expert" systems.
- (4) What kinds of access to non-DO computer files (in DI or elsewhere) will the DO see as desirable?
- (5) Which sets of DO employees ought to be able to communicate with which other sets of DO employees electronically?
- (6) What will be the impact of the CRAFT system in operational and productivity terms as we approach our installation goals?
- (7) How can we use information technology to improve cover for our employees, or help us to establish or disestablish notional cover entities more expeditiously?

For the DDA:

- (1) What are the organizational and other implications of our movement toward integrated personal information systems?
- (2) How can we use information technology to reduce to an absolute minimum the amount of time and effort devoted by Agency employees to the travel process--from initial approval of orders, to ticket acquisition, to subsequent accounting and audit?

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- (3) How can we harness information technology to further improve personal accounting in our Agency? Financial integrity?

For the S&T:

- (1) Can we identify significant areas of analysis where faster and more powerful computation would result in substantial improvements in the timeliness or quality of the analysis? Are there significant analytical problems which are not being addressed because we lack the computational power or technical expertise to do so?
- (2) What do we need to do about ensuring the accuracy and consistency of data in very large databases so that analysts are all working with the same set of facts?
- (3) How much importance do we attach to the development of AI techniques--such as image understanding, expert systems, robotics, etc.--and do we see areas of immediate application for such techniques? What kinds of problems would such techniques solve or what kinds of benefits would accrue?
- (4) In what ways could automation improve the relationship between analysts, collectors and processors of intelligence? How might our performance improve if such automation were achieved?
- (5) What unique requirements does the S&T envision for mass data storage such as imagery, video, graphics as well as text?

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- (6) Do you foresee any unique communications requirement--for example between contractors and program managers or between NPIC analysts and military users of imagery--which should be factored into our planning for teleprocessing capabilities of the future? Do you foresee any requirement for cleared contractors to have remote access to Agency automated databases?
- (7) How much of this development, operation and maintenance would the S&T really wish to control directly, and how much would it seek from central services (ODP, OC, etc.)?

For the Executive Area:

- (1) What sort of budget development/modelling system could we develop to reduce tedious detail work, further improve senior involvement in the resource allocation process, and help us make smarter resource decisions faster?
- (2) What capabilities should be available on line to senior executives via the Executive net?
- (3) How can we harness today's information technology to improve our responsiveness to congressional requests?

V. Senior Management Involvement in Decision Making

We need to get the right decisions to the seventh floor. The previous steps will help. But they will have little effect unless we can identify which decisions are of a strategic character and require senior involvement. This is not as easy as it sounds. At the moment I see four critical areas of activity, but much more attention to this question is required:

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-- What kind(s) of computer terminals/personal computers should we support for our employees? Our building now is filled with Delta Data terminals for access to the ODP mainframe and for electronic mail, and Wang systems for word processing. (We now have approximately [] Delta Data and Wang terminals installed, with more coming every day. Wang installations overseas are proceeding at about [] per year.) Our goal should be perceptible movement toward one family of terminals which will: allow future growth, provide word processing and graphics capability, allow electronic mail, provide access to the ODP mainframe, and run software which local users can purchase or develop for their own needs.

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-- What can be done about the ever increasing data reduction problem we face? The pace of growth of information technology proceeds at an amazing rate. The volume of Central Dissemination System traffic (all substantive, operational and administrative cables into and out of the Agency) has more than tripled in the last five years and the rate of growth has climbed from about six percent per year in 1979 to nearly 14 percent in 1984. DO reporting alone has grown 20 percent annually the last three years. This growth has been spurred largely by the automation of many previously manual tasks []

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[] Some believe it threatens the limits of our surge communications capacity even before the product of new overhead collection systems and the FBIS modernization become available. Obviously, we don't wish to reduce the amount of raw intelligence collected, and we may not be able to afford to build ever larger communications and information systems in order to process the glut. The answer one day will be to use information technology itself to separate the significant information from the useless residue, at every stage from collection to analysis.

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- Computer security. We face important questions about what our policies should be, about the need for and priority of various investments, and about how we are organized to carry out programs. An Information Systems Board working group has developed an internal investment strategy in this area and I have taken steps to get some of this moving. Much remains to be done. The question of security is paramount. But I believe that, in addressing security issues, we will make progress on some other problems as well.
- Communications within the new Headquarters building. The systems to be installed in our new building (and retrofitted to our present one) will either facilitate or inhibit the development of our future capabilities. The planning now underway, as I understand it, is sensible and sound. But the potential for a mistake which greatly limits our future options, or--more likely--which pushes us in one direction when another may be preferable, remains.

VI. Organizational Issues

Separate from the above five steps is another topic which I include with full knowledge that its mere mention will electrify a significant number of Agency managers: reorganization. My sense is that the swiftly evolving information technology capability available to us, together with the rapid and unrelenting growth of the interest and sophistication of Agency users, are slowing rendering obsolete the organizational structure within which we have traditionally managed many information technology activities.

For me, the test of whether reorganization is desirable in this area rests on the answers to four questions:

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- (1) Would reorganization make it possible for us to better harness the creative energies of our best people?
- (2) Would reorganization facilitate improved management control over the flow of substantive and management information?
- (3) Would reorganization improve the ability of our information technology users to drive our technical decisions?
- (4) Would reorganization improve the quality of our decision-making re the priority of future information technology investments?

Two of the fundamental organizational options available to us (other than the status quo) include: combining the Offices of Communications and Data Processing into a new organization (a fifth directorate) responsible for most aspects of our information technology activities, or decentralizing responsibility and authority over information technology activities to our four present line directorates, together with a redistribution of existing ODP, Communications, and other responsibilities.

Combining ODP and the Office of Communications has been talked about for years, though never thoroughly studied. Its major virtue is said to be that it would put one organization in charge of many aspects of the information technology problem. This is however, only partly true, as there would remain large centers of information technology activity outside this organization, in both the DO and the S&T. Frankly, I believe organizational centralization is yesterday's option. It flies in the face of much recent relevant corporate experience. Perhaps most important, it violates our growing sense of the importance of computer user involvement and control. It rests I think on a false assumption that computer service in the future will be like electricity--to be supplied by a utility. My belief is that much

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future innovation and problem-solving capability will be the product of deeply knowledgeable people working directly with information technology tools on intelligence problems--the very antitheses of the "public utility" model.

Continuing decentralization of our information technology activity, on the other hand, seems compatible with the direction in which information technology is moving, and seems maximally supportive of user needs/desires for participation and control.

A sensible eventual goal would be to have:

- the Operations Directorate responsible for "end to end" handling of all information collected overseas and "processed" in Headquarters;
- the Science and Technology Directorate responsible for national programs support (including CAMS), and computational, modelling, and analytic capability in support of national programs, other S&T operations, and general information technology R&D for all parts of the Agency;
- the Intelligence Directorate responsible for all substantive databases and information technology services for analysts;
- the Administration Directorate responsible for all management of databases and information technology services in support of our financial, logistics, personnel, travel, and other administrative processes;
- and the Executive area responsible for information technology application for our budgeting, legislative, legal and other senior management responsibilities.

Organizationally, having the DO responsible for all overseas communications and Headquarters recordkeeping and traffic handling

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functions, suggests combining the Office of Communications' Foreign Networks Division with the DO's Information Management Staff into a new organization responsible for overseas automation (CRAFT), maintenance of the overseas communications system, and all DO Headquarters retrieval, filing and registry functions.

Making the DI responsible as above suggests eventual DI management of the existing ODP Northside Center, of all DI computer operations including the SAFE program and related data bases, and of DESIST and other future stand-alone production databases, the Headquarters printing facility, and the future world of electronic dissemination of finished product. Of course such a step couldn't be taken overnight, but there is no fundamental reason why the DI shouldn't ultimately assume full responsibility for the design, operation and maintenance of its own computer facility, and for the terminal networks to access that facility.

Organizationally, after taking these two steps, there remain a very important Office of Communications component (Domestic Networks Division) responsible for communications in the Washington area and around the United States (with selected contractors and others); major engineering and communications security organizations in the Office of Communications which presently support both the Domestic and Foreign Networks Divisions, and those portions of our Office of Data Processing responsible for CAMS and for those ODP systems devoted to DDA administrative functions like finance, personnel, logistics, and others, as well as Headquarters computer operations.

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Continuing the restructuring, responsibility for management of CAMS is relatively easily moved to the S&T Directorate. Combining the balance of ODP with the former Domestic Networks Division of the Office of Communications would be a sensible immediate move in the direction of a redesigned DDA component responsible for management of all our administrative systems. The function of OC's important communications security and engineering organizations would necessarily be combined into the Directorate-based components as appropriate. This would also

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be a sensible time to consider merging the communications and computer security functions, now separately resident in OC and the Office of Security.

Taken together, such a reorganization could:

- recognize the fundamental character of the evolving information technology revolution by positioning the DO, the DI, and the S&T to design, manage, and seek resources for all aspects of the information technology systems they require to accomplish their missions, while focusing the DDA role in information technology on support of its mission responsibilities;
- more clearly illuminate future information technology investment decisions by forcing line attention to the alternatives available in a mission-related context (for example, the DDI would consider information technology investments in the context of all the other investments he now considers);
- facilitate user involvement and control of all aspects of our information technology investment and, ultimately,
- improve our ability to challenge our best people by making them more nearly part of team efforts to accomplish mission-related goals.